



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,638	09/25/2003	Takeo Seino	Q77712	4469

23373 7590 07/05/2005

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

GARCIA JR, RENE

ART UNIT PAPER NUMBER

2853

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/669,638	SEINO ET AL.	
	Examiner	Art Unit	
	Rene Garcia, Jr.	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>23 February 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Paragraph 0065 “FIGS. 6A and **68**” (Perhaps mean 6B instead of 68). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 12 Reference Numbers **63** and **64**. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

Art Unit: 2853

examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because of the phrase "comprising.

Correction is required. See MPEP § 608.01(b).

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Liquid Container For A Liquid Ejection Device
With A Vibration Sensor For Ink Level Detection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2853

7. Claims 1, 4, 7, 8 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al (US 6,270,210) in view of Young et al. (US 2003/0015036).

Yamaguchi et al. disclose the following claimed limitations:

- * regarding claims 1 & 10, a liquid container/cartridge with bag, 1/ for a liquid ejection device (Abst)

- * a liquid supply port/14/ for supplying liquid/ink/ to a liquid ejection head (col 2, lines 9-11);

- * a flexible member deformable/bag portion of the cartridge, 10/ in accordance with an amount of remaining liquid contained in the liquid container/cartridge with bag/

- * a rigid member/20/ provided on a second surface of said liquid container

- * regarding claim 4, wherein said rigid member/detecting plate, 20/ is stuck to an outer or inner surface of said liquid container/ink cartridge, 1/ (the detecting plate is located beneath the cover face of the cartridge, thereby being on the inner surface of the bag) (fig. 1).

- * regarding claim 7, wherein said liquid container/bag portion of the cartridge/ is housed in a hard case/the cartridge/, and said rigid member/detecting plate, 20/ is formed with said hard case/cartridge/ (fig. 1).

- * regarding claim 8, wherein said liquid container/bag portion of cartridge, 10/ is housed in a hard case/the cartridge, outer cover/ which has a raised portion/sloped portion, 32/ in a predetermined region located apart from said liquid supply port/14/ in a

Art Unit: 2853

region of said liquid container/cartridge with bag, 1/ which serves as a bottom surface when said liquid container is set in the liquid ejection device (col 6, lines 7-9, figs 1 & 6).

Yamaguchi et al. do not disclose the following claimed limitations:

- * further regarding claim 1, a vibration activating and detecting unit provided on a first surface of said liquid container, for emitting a vibration to said liquid;

- * a rigid member provided on a second surface of said liquid container, so as to be opposed to said vibration activating and detecting unit;

- * wherein an amount of remaining liquid is detected based on a vibration characteristic of said vibration activating and detecting unit which depends on a distance between said vibration activating and detecting unit and said rigid member.

- * further regarding claim 10, a vibration activating unit provided on a first surface of said liquid container, for emitting a vibration to said liquid;

- * a vibration detecting unit provided on a second surface of said liquid container so as to be opposed to said vibration activating unit;

Young et al. disclose the following:

- * further regarding claim 1, a vibration activating /resonating means, 24/ and detecting unit/sensing means, 30/ provided on a first surface of said liquid container/tank, 12/, for emitting a vibration to said liquid /paragraph 0016/ for the purpose of providing an accurate measurement of liquid level within a liquid container.

- * a rigid member/the outer wall of container/ provided on a second surface of said liquid container/tank, 12/, so as to be opposed to said vibration activating/resonating

Art Unit: 2853

means, 24/ and detecting unit/sensing means, 30/ for the purpose of responding to the vibration signals provided from the tank/container/ wall;

* wherein an amount of remaining liquid is detected based on a vibration characteristic of said vibration activating/resonating means, 24/ and detecting unit/sensing means, 30/ which depends on a distance between said vibration activating /24/ and detecting/30/ unit and said rigid member /the outer wall of the container/ for the purpose of measuring the liquid in the container /paragraph 0023/(fig. 1).

* further regarding claim 10, a vibration activating unit/resonating means, 24/ provided on a first surface of said liquid container, for emitting a vibration to said liquid; and a vibration detecting unit/sensing means, 30/ provided on a second surface of said liquid container/tank, 12/ so as to be opposed to said vibration activating unit/24/for the purpose of providing an accurate measurement of liquid level within a liquid container (fig. 1).

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a vibration activating and detecting unit provided on a first surface of said liquid container, for emitting a vibration to said liquid; a rigid member provided on a second surface of said liquid container, so as to be opposed to said vibration activating and detecting unit; wherein an amount of remaining liquid is detected based on a vibration characteristic of said vibration activating and detecting unit which depends on a distance between said vibration activating and detecting unit and said rigid member; a vibration activating unit provided on a first surface of said liquid container, for emitting a vibration to said liquid; and a vibration

Art Unit: 2853

detecting unit provided on a second surface of said liquid container so as to be opposed to said vibration activating unit as taught by Young et al. into Yamaguchi et al. for the purposes of providing an accurate measurement of liquid level within a liquid container, responding to the vibration signals provided from the tank/container/ wall; measuring the liquid in the container and for the purpose of providing an accurate measurement of liquid level within a liquid container.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al (US 6,270,210) as modified by Young et al. (US 2003/0015036) as applied to claim 1 above, and further in view of Usui et al. (US 6,536,861).

Yamaguchi et al. as modified by Young et al. disclose all of the claimed limitations except for the following:

* regarding claim 2, wherein said vibration activating and detecting unit includes a substrate capable of maintaining a constant shape irrespective of deformation of said liquid container.

Usui et al. disclose the following:

* regarding claim 2, wherein said vibration activating/vibrating plate, 176/ and detecting unit/piezoelectric layer, 160, actuator (106) detects the residual vibration and causes vibration of contained liquid/ includes a substrate(col 10, line 48, col 19, lines 31-35, col 25, lines 6-20, figs 22 A-C, 110)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a constant shape irrespective of deformation of said liquid container, since it has been held to be within the general skill of a worker in the art to

Art Unit: 2853

select a known material on the basis of its suitability for the intended use for the purpose of contacting the ink inside the container. *In re Leshin, 125, USPQ 416*. Material

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a substrate as taught by Usui et al. into Yamaguchi et al. as modified by Young et al. for the purpose of providing an increase in the accuracy of the detection of the resonant frequency.

9. Claims 3, 5, 6 & 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al (US 6,270,210) as modified by Young et al. (US 2003/0015036) as applied to claim 1 above, and further in view of Usui et al. (US 6,536,861).

Yamaguchi et al as modified by Young et al. discloses all of the claimed invention except for the following:

* regarding claim 3, wherein a through-hole is formed in said liquid container at a location corresponding to a vibration region of said vibration activating and detecting unit, and said vibration activating and detecting unit is provided on a substrate having a recess into which liquid of said liquid container flows, and a vibration is emitted from said vibration activating and detecting unit to said liquid via said recess

* regarding claim 5, wherein a plurality of said vibration activating and detecting unit and a plurality of said rigid members are arranged in a direction in which a liquid level of liquid in said liquid container changes.

Art Unit: 2853

* regarding claim 6, wherein an adhesive layer with which said substrate is liquid tightly fastened to said liquid container, is formed on a front or back surface of said substrate.

* regarding claim 9, wherein conductive patterns are formed on a surface of said liquid container, which said conductive patterns are connected to said vibration activating and detecting unit.

Usui et al. disclose

* regarding claim 3, wherein a through-hole/1C/ is formed in said liquid container/ink cartridge, 1/ at a location corresponding to a vibration region/123B/ of said vibration activating/vibrating plate, 176/ and detecting unit/piezoelectric layer, 160, actuator (106) detects the residual vibration and causes vibration of contained liquid/, and said vibration activating/176/ and detecting unit/160/ is provided on a substrate/actuator, 106/ having a recess/cavity, 162 of fig 22A-C/ into which liquid of said liquid container flows, and a vibration is emitted from said vibration activating/176/ and detecting unit/160/ to said liquid via said recess (col 10, line 48, col 11, lines 6-10, col 19, lines 31-35, col 25, lines 6-20, figs 22A-C, 32 A-C, 110) for the purpose of contacting the ink inside the container.

* regarding claim 5, wherein a plurality of said vibration activating and detecting unit /65A-C (actuators 106)/ and a plurality of said rigid members /side walls of cartridge, 1/ are arranged in a direction in which a liquid level of liquid in said liquid container changes for the purpose of detecting the remaining ink amount in a step-by-step manner (fig. 99).

Art Unit: 2853

* regarding claim 6, wherein an adhesive layer/col. 19, lines 40-42/ with which said substrate/col. 19, lines 31-35/ is liquid tightly fastened to said liquid container/ink cartridge, 1; col 21, lines 9-12/, is formed on a front or back surface of said substrate for the purpose of providing easy assembling of the liquid container.

* regarding claim 9, wherein conductive patterns/lead wires, 104a & 104b/ are formed on a surface of said liquid container, which said conductive patterns are connected to said vibration activating and detecting unit /col. 37, lines 42-52/ for the purpose of transferring a driving signal to the actuator and transferring the signal of resonant frequency detected by the actuator (figs. 37 & 41).

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a through-hole is formed in said liquid container at a location corresponding to a vibration region of said vibration activating and detecting unit, and said vibration activating and detecting unit is provided on a substrate having a recess into which liquid of said liquid container flows, and a vibration is emitted from said vibration activating and detecting unit to said liquid via said recess; wherein a plurality of said vibration activating and detecting unit and a plurality of said rigid members are arranged in a direction in which a liquid level of liquid in said liquid container changes; an adhesive layer with which said substrate is liquid tightly fastened to said liquid container, is formed on a front or back surface of said substrate; and wherein conductive patterns are formed on a surface of said liquid container, which said conductive patterns are connected to said vibration activating and detecting unit, as

Art Unit: 2853

taught by Usui et al. into Yamaguchi et al. as modified by Young et al. for the purpose of contacting the ink inside the container, detecting the remaining ink amount in a step-by-step manner, easy assembling of the liquid container, and for the purpose of transferring a driving signal to the actuator and transferring the signal of resonant frequency detected by the actuator.

Conclusion

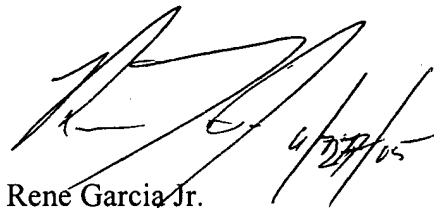
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Usui (US 6,745,626) discloses a liquid detection device having a liquid vibration section. Nakazawa et al. (US PG PUB 2001/0040613) discloses an ink cartridge having a cartridge case with ink bags housed in the cartridge case. Omatoi (JP 11-258026) discloses an ultrasonic vibrator attachment adaptor for detecting existence and level of liquid in a container containing liquid.

Art Unit: 2853

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rene Garcia, Jr. whose telephone number is (571) 272-5980. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rene Garcia Jr.
27 June 2005



K. FIGGINS
PRIMARY EXAMINER